

Factors Affecting Students' Decision to Undertake Online Learning

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Abstract: The expansion in the scale of online higher education has been accompanied by a paradigm shift in the quality enhancement of online higher education, with from an emphasis on the adequate supply of institutional resources and the expansion of student numbers to a focus on student learning outcomes directly related to the benefits of student learning. This paradigm shift is also reflected in national policy. This paradigm shift is also reflected in national policy, which has been in place since 1998 when the Ministry of Education officially. Since 1998, when the Ministry of Education formally approved pilot institutions for online higher education, online higher education has entered a phase of rapid development. As the scale of online higher education enrolment has expanded dramatically, student learning outcomes have become a focal point for measuring quality improvement. In 2018, the Ministry of Education launched the Notice on the Annual Report on the Development of Continuing Education in Higher Education, which includes student learning effectiveness as an indicator for assessing the quality of continuing education in higher education. So, how should we evaluate the effectiveness of student learning? What are the factors that influence it? How can these factors be effective to achieve the purpose of influence? This study attempts to empirically investigate the mechanisms of the factors influencing the learning effectiveness of online higher education students in an engineering university in Beijing based on institutional influence theory, using structural equation modelling. The study found that. (1) More than 70% of students believe that their professional and vocational knowledge and skills have been developed through online higher education study, and they have greater hopes for career advancement and wider career choices. More than 70% of students also believe that their professional knowledge and skills and problem-solving skills have been improved, and they are more satisfied with the curriculum, the school platform and the work of teachers. (2) There are differences in the influence paths of each influencing factor. There are two pathways for the influence of curriculum and self-efficacy on students' learning outcomes: a direct pathway and an indirect pathway mediated by behavioural engagement and student-teacher interaction. Behavioural engagement and teacher-student interaction are both direct influences and also play a mediating role in moderation. In contrast, there is only a direct path of influence on student motivation, and the learning platform can only indirectly influence student learning outcomes through teacher-student interaction. (3) This study verifies the applicability of the institutional influence theory to students in online higher education, as environmental and student background factors can have direct or indirect effects on student learning outcomes.

Keywords: Online higher education, Learning outcomes, Influencing factor.

1. Introduction

Currently, traditional education can no longer meet the learning needs of learners, and distance education has certain drawbacks in teaching applications due to the lack of sharing and comprehensiveness of learning resources. With the development of science and technology, big data processing technology and open-source architecture platform have promoted the emergence of a new development mode of education informatization, namely online learning platform. Such large-scale online open courses are equipped with diverse learning resources and diversified learning support service tools to meet the learning needs of various types of learners. However, in practical application, researchers have found that the actual learning situation of learning users is not optimistic. Many online courses have a large number of registered learners at the beginning of the course, but as the course progresses, many learners choose to give up midway or have low learning results (Balw 2017). These phenomena should not be ignored by course organizers and platform managers, and researchers need to analyze the online learning behavior of learners in time to improve the effective usage and user flow of online learning platforms.

In the theoretical sense, the concept of online higher education is not new, but only in recent years has the academic community begun to systematically sort out and study it. By integrating the historical trajectory and theoretical foundation, we can answer the basic questions of what is "online higher education" and what are its essential characteristics (Montenegro 2017). At the same time, we can enrich the theoretical research of online higher education and promote the theoretical construction of online higher education by grasping its overall context, exploring its development mode, analyzing its strategic prospect, and thinking and suggesting its Chineseization.

In terms of practical significance, the practical significance of online higher education is much greater than its theoretical significance. From the perspective of development, online higher education should be a discipline in which "practice precedes theory". The study of the essence, historical process and future prospect of online higher education should be aimed at better serving the practical activities of online higher education. As a product of online education, online higher education is not only the combination of Internet technology and higher education, but also the integration effect that they can bring together is far beyond people's imagination, and

even the best theorists cannot predict how the future of online higher education will be a colorful scene (Hew, Huang, Chu et al. 2016). Based on such unpredictability, the development of online higher education must not be purely philosophical and theoretical, but must be put into practice in every living case.

1.1. Literature Review

(1) Current status of domestic research

Xiaoyong Hu and others (2022) found that students' satisfaction with teachers' evaluation of teaching quality, students' interest in learning, and the nature of students' majors affect the frequency and willingness of students to use online teaching. The higher the satisfaction of students, the stronger their interest in learning, and thus the stronger their willingness to participate in online teaching. Zhe Zhang and others (2016) used the Theory of Rational Behavior, the TAM model and the Integration Model of Technology Acceptance and Use in his study of the influencing factors related to college students' willingness to consistently use online learning platforms, and also explored the influence of them using questionnaire survey method and quantitative analysis. The research results show that the influencing factors that affect college students' persistence in online learning include the quality of courses provided by the platform, students' after-school Q&A communication, the convenience of using online learning products and the issue of paying for online learning products. Based on the results of the study, Zhengping suggested that relevant companies need to plan their development around these factors, create an online learning platform to improve their industry competitiveness, and use enhanced publicity to maintain and develop new and existing customers. Zhihui Jiang and Chengling Zhao (2018) surveyed 299 college students using three questionnaires: online course learning, academic emotion scale, and willingness to learn behavior concluded that positive academic emotion played a significant positive mediating role in students' course learning and willingness to learn behavior online in online learning courses, but negative academic emotion did not have no significant effect on willingness to learn behavior.

(2) Current status of foreign research

The real beginning of online learning originated abroad, so the relevant theoretical results and research techniques abroad are richer and more mature. Sean B. Eom & Nicholas Ashi (2016) in their study of the factors that influence the persistence of online learning, suggested that positive student attitudes have a significant role in self-efficacy, and as with traditional forms of education, high self-efficacy in online learning usually encourages students to increase their self-confidence and autonomy. Gary Cheng & Juliana Chau (2016) studied students' online and offline blended learning and concluded that students prioritize content access and engagement, and therefore the relevant platforms need to develop more effective online components to achieve high quality instruction. In addition, students in online learning still rely on classroom discussions that take place during face-to-face meetings, and interaction is important for students to continue learning online. Doleck T, Bazelais P, et al. (2018) who studied college students' motivation to learn in online courses, suggested that motivation is closely related to learners' self-directed learning, social interaction, and personal interest in completing their homework assignments and taking online courses. Mahendra Adhi Nugroho, Dhyah

Setyorini, and Budi Tiara Novitasari (2019) argue that some innovative learner-teacher engagement strategies should be offered based on abandoning traditional top-down engagement strategies to provide a student-centered approach to engaging students in online learning. an interactive learning environment to create a sustainable student-centered online classroom for continuous online learning.

1.2. Theoretical/Conceptual Framework

Willingness of online learning

The difference between the willingness to learn online and the willingness to learn described above is that one is a virtual classroom supported by the technological environment of online information, while the other refers to a traditional classroom. However, the willingness of students to participate in online learning does not change the nature of participation because of the collision of classroom formats (Xu, Chen and Chen 2020). The willingness to participate in the traditional classroom is essentially the same, as students are able to browse, discuss, instruct, practice, experiment, complete assignments, and present and share their learning through virtual learning, which also involves emotional, behavioral, and cognitive changes.

In online teaching, students' willingness to learn online refers to their willingness to participate in learning in the virtual space of the Internet, their specific behavior in learning, their specific participation and contribution to online activities, and their specific level of sharing (Sun and Gao 2019).

Institutional impact theory

Institutional impact theory is an important component of student development theory, which focuses on the influence of the institutional environment and student background on individual student development, and explores the dynamic development of students in the institutional environment. Institutional impact theory has been shaped and developed by developments in psychology and sociology. Psychological developmental theories divide student development into one or several dimensions, which include changes in the nature of student content and student intrinsic Shu Zhongmei, Qu Qiongfei. Analysis of college students' learning outcomes based on educational data mining. Based on this, institutional impact theory concludes that students' development includes individual values, skills and development in terms of knowledge. Under the influence of sociology, institutional influence theory relates the institutional environment, organisational structure and individual student development. and organisational characteristics influence students' behaviour, beliefs, lifestyles, cognitions and attitudes^[10,11]. The development of Institutional Influence Theory was also influenced by the development of the institutional environment and organisational structures.

1.3. Significance of the Study

Practical significance

Student learning effectiveness is an important indicator of the quality of online education. By studying the factors influencing student learning effectiveness in online higher education, we can understand what factors affect student learning effectiveness and how these influences work, and then take corresponding measures to improve student learning effectiveness. From the school's perspective, the school has By understanding what factors influence student learning outcomes in online higher education and how these factors

work, schools can propose targeted measures to improve student learning outcomes (Lin, Zheng and Zhang 2017). By understanding the factors that contribute to the learning effectiveness of online higher education students, and by knowing how these factors work, the school can propose targeted ways and paths to cultivate talents and thus improve the quality of talent training.

Theoretical significance

This study applies the institutional influence theory of higher education to explain the factors affecting student learning in online higher education. This study applies the institutional influence theory of higher education to explain the problem of factors influencing student learning in online higher education. For online higher education, the current research on the factors influencing students' learning effectiveness This study will provide a new approach to the study of factors influencing student learning outcomes in online higher education, as most of the theories used in the study are focused on distance education theories and rarely involve the theories of higher education. This study will provide a new theoretical perspective for this research. For institutional impact theory, which originated in the United States, it has rarely been applied to higher education. This study will provide a new theoretical perspective on institutional impact theory, which has its origins in the United States and has rarely been applied to the Chinese educational environment. On the other hand, this study will also explore the localisation of the theory in China.

1.4. Objectives of the Study

This study intends to identify the factors affecting the decision of the students to undertake online learning. The specific objectives of this study are the following:

To describe the current situation of learning in _____ (locale of your study).

To identify the factors affecting the choice/preference of the students to undertake online learning.

(Add more objectives to make it a quantitative study as you have mentioned in your study design)

2. Materials and Method

2.1. Study Design

In this study, a combination of qualitative and quantitative research methods was used, which contained literature review, observation, content analysis, and questionnaire survey. And the questionnaire is attached as an appendix.

2.2. Sample/Population of the Study

The target population of this study are the adult learners in online higher education. Considering the need for quantity

and the feasibility of sample collection, as well as ensuring the evaluation of the whole process of students' in-school training, the spring 2022 graduates of the University of C's School of Distance Education who received different majors in online higher education will be selected as the research population for this study.

2.3. Data Gathering Tools

With the help of the U of C Distance Education College teachers, this questionnaire was distributed over a period of 16 days and a total of 850 completed answers were received. To ensure that the sample data had a high quality of completion, the author cleaned these 850 raw data. The final data obtained for empirical analysis was 679 valid The sample validity rate of the returned questionnaires was 80%.

A survey questionnaire will be used to gather the data pertinent to this research. We designed a questionnaire to summarize and evaluate the specific situation of college students' participation in online learning, to summarize the real feelings and experiences of college students during their participation in online learning, and to provide some basis for improving the strategy.

2.4. Data Gathering Procedures

Development and revision of measurement scales

In designing the measurement scale, we used the literature review to determine the theoretical basis for the construction of the scale, and then summarized the measurement indicators of online higher education students' learning effectiveness based on the literature analysis. Then, based on the literature analysis, we summarized the indicators for measuring the learning effectiveness of online higher education students, and used the literature to determine the factors affecting the learning effectiveness of online higher education students and their questions. Finally, according to the learning characteristics of adult learners, the scale items were adjusted. Finally, the scale items were adjusted according to the learning characteristics of adult learners. Formation of the pre-test scale.

After forming the pretest scale, two teachers working in online higher education were first consulted, mainly from their long experience in online education. The scale was revised from the long experience of working in online education, followed by consultations with a PhD in education and a PhD in management. The next consultation was with a PhD in education and a PhD in management to revise the scale items mainly from a theoretical perspective. Finally, we tried to get some of the students to fill in the questions. The scale was then revised by consulting with a doctor of education and a doctor of management, mainly from a theoretical perspective. as shown in Table 1.

Table 1. Online higher learning student outcome factors

Potential variables	Code	Measurement question item
Motivation to learn	LM1	To improve their professional knowledge
Self-efficacy	LM2	To be able to rationalise learning time in accordance with the
Curriculum	LM3	The course content is practical and solves practical problems
Learning Platform	LM4	The platform works well
Behavioural engagement	LM5	To ask the teacher questions about learning
Teacher-Student Interaction	LM6	The teacher reminds us to complete our learning tasks in a timely
Learning outcomes	LM7	E-learning expands knowledge

2.5. Treatment of Data

This study uses SPSS.16 analysis software to test the reliability of the research questionnaire data, of academic burnout and each factor of burnout causation.

2.6. Ethical Considerations

Supporting participants to decide for themselves whether to be anonymous can give them more choices. Currently, many questionnaires are usually anonymous in order to protect the participants directly, but from a practical point of view, anonymity does not provide real protection for the participants. Therefore, the author suggests discussing the pros and cons of anonymity with participants and then allowing them to decide for themselves whether to fill in their real names in the questionnaire.

3. Results and Discussion

The results show (Table 2) that the coefficient of

Cronbach's alpha for learning motivation is 0.766, the coefficient of Cronbach's alpha for self-efficacy is 0.891, the coefficient of Cronbach's alpha for curriculum is 0.915, the coefficient of Cronbach's alpha for learning platform is 0.930, the coefficient of Cronbach's alpha for behavioural engagement is 0.879, the coefficient of coefficient was 0.879, the coefficient of teacher-student interaction Cronbach's alpha was 0.966, the coefficient of learning effectiveness Cronbach's alpha was 0.947, and the coefficient of questionnaire overall Cronbach's alpha was 0.972. According to According to De Vellis et al. the coefficient value of alpha is fairly good between 0.7 and 0.8, and the coefficient value of alpha is very good between 0.8 and 0.9. This means that the higher the value of the coefficient of α , the higher the confidence of the data. The seven potential variables in this study The coefficient values of α for all seven potential variables in this study are greater than 0.7, which indicates that the potential variables in this study are more reliable.

Table 2. Reliability statistics: Cronbach's Alpha

Potential variables	Code	Measurement question item	Cronbach's Alpha
Motivation to learn	LM1	To improve their professional knowledge	0.766
Self-efficacy	LM2	To be able to rationalise learning time in accordance with the proposed learning objectives	0.891
Curriculum	LM3	The course content is practical and solves practical problems	0.915
Learning Platform	LM4	The platform works well	0.930
Behavioural engagement	LM5	To ask the teacher questions about learning	0.879
Teacher-Student Interaction	LM6	The teacher reminds us to complete our learning tasks in a timely manner	0.966
Learning outcomes	LM7	E-learning expands knowledge	0.943

4. Conclusion and Recommendations

When analysing the validity of the research questionnaire, this study used exploratory factor analysis. Before conducting the exploratory factor analysis, the KMO value and Bartlett's sphericity test were conducted on the research data using SPSS.16. The results showed that the KMO value was 0.976, which was greater than 0.7, and in the Bartlett's sphericity test, the approximate chi-square value was 25724.570, the degree of freedom (df) was 780, and the significance (Sig.) was 0.000. This indicates that the significance level of the Bartlett's sphericity test meets the significance requirements of the two-tailed test. From the above data, it indicates that the research questionnaire data is suitable for exploratory factor analysis.

The results showed that out of the 7 items measured in the questionnaire, 7 common factors with eigenvalues greater than 1 could be extracted. The rotation method used was the maximum variance method, and the total explained variance after rotation was 75.665%, indicating that the 7 factors extracted were able to reflect 75.665% of the information of the measurement question items. It can be seen that the loadings of the measures belonging to the same variable are all greater than 0.6 in their corresponding dimensions, This indicates that the internal structure of the questionnaire is clear and has good structural validity.

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APPENDIX

Questionnaire

- (1) How many online courses have you participated in online learning? ()
- (2) The number of times you logged on the online course teaching platform after class within two weeks ()
- (3) Please fill in your preparation time for each online study ()
- (4) After browsing the content of online courses, can you usually clarify your learning tasks and learning goals?
- Fully
 - Can
 - Can't
 - Not at all
- (5) Do you actively make online learning plans?
- All the time
 - Sometimes
 - Basically not
 - No
- (6) When you use online learning platform to study, through which ways do you mainly share quality resources with your classmates?
- Posting the website name or link on the forum
 - Send by email
 - Use online or offline to send
 - Storing in the journal for sharing
 - Dictated by video or voice
 - Other
- (7) Do you pay attention to the online learning dynamics of your classmates?
- Every time you log in, you will look at them
 - Basically not
 - Most of the time will check
 - Never pay attention to
- (8) When you encounter a problem you can't solve, through what channel will you usually solve it?
- Find relevant information on the Internet by yourself
 - Study forum posted on
 - Contact teachers
 - Discuss with classmates
 - Send an email to the relevant experts
 - Put it aside